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Midwest Program for Airborne Television Instruction (MPATI) Educational TV Facilities Act (PL 87-447) The growth and progress of educational television is described. Grants for the construction of noncommercial television (TV) broadcasting stations (Educational TV Facilities Act), grants of surplus property under the Surplus Property Act, and money for research and equipment under the National Defense Education Act have aided the growth of educational TV. Greater use is made of educational TV because of greater use of ultra high frequency (UHF) and channel reservations for education made by the Federal Communications Commission (FCC). The four types of TV services which are used for education are the broadcast station, instructional TV fixed service operating for particular receivers rather than for the entire community, the cable distribution system providing for closed circuit TV, and the transmission of signals from an airplane to a ground receiving institution. An example of this last service is the Midwest Program for Airborne Television Instruction, Inc. (MPATI). The Educational TV Facilities Act is based on local control. This local control can be a cooperative venture with both corporations and associations taking part. Most small school systems profit from educational TV which makes possible effective instructional methods, a greater range of curriculum choice, and an increase in the autonomy of school administrators who are in control of the use of educational TV. Cost of educational TV systems varies considerably according to type of service and amount of use.							
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Federal Programs for Educational Television

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Raymond Heinz, the teacher-principal of a small rural grade school in Hardy County, W. Va., arrives for classes each day carrying a television set. His school, similar to the more than 800 one-room schoolhouses in the state, is different in one way. Mr. Heinz uses television for part of the daily instruction. In the evening, to prevent possible vandalism, he puts the set on his truck and returns home with it. Seventeen children in the school receive a regular part of their education by television. Program lessons are picked up off-the-air from a television station in nearby Virginia. The set, purchased by Mr. Heinz with his own money, is a measure of his conviction that television greatly increases the educational opportunities available to his pupils.

In all parts of the United States the use of television continues to grow. It has been estimated that TV is used in the teaching of over seven million pupils in more than 800 school systems and 400 colleges and universities. Much of this instruction is by means of some 500 school or institutional closed-circuit TV systems, but an increasing amount is provided by noncommercial educational broadcast TV stations.

By the close of 1963, there were 85 educational television broadcast stations in the United States. In addition to students in school, they serve a potential home audience in excess of 100 million. The momentum of station planning and activation is steadily increasing as state legislatures appropriate construction and operating funds, and as local school districts and community organizations recognize the advantages of educational television service. Requests to the Federal Communications Commission for permission to construct educational television broadcast stations have zoomed from an average of nine a year during the first 10 years of development to 20 in 1962 and 28 in 1963. A review of state and local planning indicates that construction may begin on as many as 40 stations during 1964 with one new station activated each week by fall.

This greatly increased activity is due in large part to recent federal actions

designed to break two major bottlenecks in educational television development. These were the difficulties encountered by educators in raising capital funds necessary to start television stations and the inadequate number of available channel allocations.

ETV Facilities Act

The attack on the capital fund problem is led by the Educational Television Facilities Act (Public Law 87-447). This legislation, which began with passage of the Magnuson Bill in the Senate, followed by the Harris-Roberts Bill in the House, was signed by President Kennedy on May 1, 1962. The program is administered by the Secretary of Health, Education, and Welfare.

While it has been difficult to provide the initial capital investment to begin an educational television station, once on-the-air, experience has shown that station operating funds are available locally for service provided. Typically, the advantages of ETV have not been fully appreciated until after a station is on the air. While ETV is especially important to school programs in sparsely populated areas of the country, capital funds are less available there. Congress accepted by a healthy majority the proposition that "seed corn" in the form of federal assistance for station construction was desirable provided no federal interference or control over programming was permitted. Representatives of education joined with representatives of the commercial television industry in urging passage of the bill.

The Act makes available matching grants to assist in construction of new noncommercial television broadcasting stations or expansion of existing ETV stations. Appropriations totaling \$32 million are authorized over a five-year period to be used in grants for the acquisition and installation of transmission apparatus necessary for ETV broadcasting on channels reserved by the FCC for educational use.¹ Expenditures for

¹ Exceptions are made in those cases in which the Commission accepted for filing on or before May 1, 1962, applications to construct an ETV broadcast station on unreserved channels.

such items as land, buildings, and furniture are not to be included in an approved project.² No more than \$1 million of federal funds may be applied to facilities within any one state. Grants may be up to 50 percent of the reasonable and necessary cost of an eligible project. An additional amount of up to 25 percent of the cost of the eligible transmission apparatus owned by the applicant on the date of the application is also allowed, but in no case may the federal grant exceed 75 percent of the project cost.

In the first six months operation of the program, over 50 applications had been received and federal funds in excess of \$8 million had been requested.

Other Federal Programs Aiding ETV

Several additional federal programs provide assistance to educational television in a number of other ways. During 1962 Congress extended the provisions of the Surplus Property Law (Public Law 87-786), administered by the Department of Health, Education, and Welfare. Educational television stations licensed by the FCC are now included among institutions eligible for donations of U. S. surplus property.

In addition, two titles of the National Defense Education Act, administered by the U. S. Office of Education, are available to assist educational television development. Title VII provides that financial grants and contracts may be made for research and demonstrations in the application of educational media—including radio, programmed instruction, film, and audio-visual aids, in addition to educational television—and in the dissemination of information concerning educational media. Title III makes it possible for states to include television receivers in their list of equipment for which federal matching funds may be available if used for instruction in science, mathematics, and modern foreign languages.

The second problem, that of securing

² A more complete description of the program is contained in Elaine Exton's "Word From Washington," AMERICAN SCHOOL BOARD JOURNAL, July, 1962, p. 20.

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the frequency allocations with which to do the job, was notably serious in the eastern metropolitan complex extending from New England to Washington, D. C. In the greater part of this area, which includes one fifth of the population of the United States, commercial stations had been set up and use made of most existing VHF channels before educational television was seriously under way. Informed persons, looking ahead, could see the day when the channel shortage would be far more general. A survey of educators, made in 1961 to estimate channel needs over 10 years, concluded that educational television would require at least 1142 channels.

The channel shortage, actual and predicted, is now being alleviated because of three actions, each involving the Federal Communications Commission, the regulatory agency responsible for granting authorizations for television broadcasting.

The first move was made by Congress in 1962 when it passed the all-channel receiver legislation. Since April 1, 1964, television receivers shipped in interstate commerce are required to provide for the reception of all television channels. This includes Channels 14 through 83 which are in the ultrahigh frequency range (UHF), as well as Channels 2 through 13, which are in the very high frequency range (VHF), to which almost all presently owned sets are limited. The new law greatly assists the development of educational television; more than two thirds of the channels reserved for education lie in the UHF range. Sets manufactured to receive only the VHF range require an adapting attachment to permit UHF reception. This is sufficiently costly to discourage widespread use. As a result neither educational nor commercial interests have used UHF channels to any extent. However, with the assurance of an ever increasing number of all-channel receivers in homes, there is new interest in the activation of stations using the UHF range.

Not satisfied with this action alone, the FCC is now in the midst of further increasing educational opportunities. It is currently proposing to reserve for education an additional 384 television channels over and above the 347 channels presently reserved for educational use. The Commission's proposal, made in connection with the establishment of a new table of channel allocations for the whole of the television industry is now in the final stages of decision-making. School boards and others have been invited to study the proposal and comment formally on it.

Yet the FCC was aware that education would continue to face problems in the future even with these actions. The VHF channels were almost completely occupied. Of approximately 3500 UHF channel assignments over 1000 fell in nearly uninhabited areas and therefore could not be used. The 2500 potential assignments remaining would have to meet the present and future

broadcasting needs not only of educators but of commercial operators as well.

While channels were limited, demand for them would grow. Once educational institutions began to use television, the capability for providing televised instruction in more than one subject or to more than one age group, at any one time, became desirable. Multichannel operation on any large scale is impossible by means of broadcast television because of the limited channels in any one area. There was a question also as to the appropriate use of valuable spectrum space. Much of the in-school curriculum did not have to go to the general public and become available to the home receivers in the community.

Instructional TV Fixed Service

The Federal Communications Commission's solution was to provide for what they have termed the instructional television fixed service to operate between 2500 and 2690 Mc on the frequency spectrum. This service makes it possible for schools, colleges, welfare or medical units, and other public agencies to have at their command a number of channels; up to 16 are available within a community. One or more specific programs may be telecast, point-to-point, to a limited number of specific receiving installations. With this service, schools in a school district may be linked together or a number of hospitals within a limited area may be served, but the general public is unable to receive the programs on their standard home receivers. The cost of the receiving installation is higher than the existing home TV installation, but the cost of the transmission installation is lower than that required for a television broadcast station. It is an institutional system. It was not designed to take the place of the broadcast station, FCC engineers pointed out, for it did not serve the same needs. Broadcast stations perform the dual role of serving for instruction in the school and in the home, as well as a source of quality programming for the public. The new service serves only those locations equipped with special receiving equipment³.

It is expected that many educational institutions will eventually be served both by the broadcast station and by a fixed instructional television system. This will be limited to institutions and communities with sufficiently large audiences and available operating capital. The instructional television fixed service became available to educators in 1963, and the first application for authority to operate such a service was filed January 6, 1964, by the Plainview-Old Bethpage Public Schools, Plainview (L. I.), N. Y.

The average viewer of commercial television programs is unprepared for the great variety of television services being used for educational purposes. A third type is by means of a cable

³ For details on the instructional television fixed service see also Elaine Exton, "Word From Washington," AMERICAN SCHOOL BOARD JOURNAL, December, 1962, p. 30.

distribution system on an ownership or lease basis providing for closed-circuit television. An example of a multichannel leased television distribution system is the Washington County, Md., installation. South Carolina employs a leased statewide cable and microwaved complex for multiple television distribution of in-school programs. The essential characteristic of closed-circuit television is that programs are designed for special groups, not for general broadcast, and that service is limited to particular locations, a number of rooms in one building, or to a number of buildings. The picture signal, which may be carried from the camera to the receiver by cable, also may involve the use of microwave, a highly directed signal that is received by specially placed antenna.

MPATI Still Experimental

A fourth type of service, still defined as experimental, is accomplished by transmitting the signal from a flying airplane to receiving institutions. At present instructional television from an airplane represents an alternative to schools in portions of six states. The Midwest Program for Airborne Television Instruction, Inc. (MPATI) is transmitting instruction to parts of Indiana, Illinois, Kentucky, Michigan, Ohio, and Wisconsin. About 1125 schools, enrolling approximately 465,000 students, are participants. MPATI is now petitioning the FCC to authorize operations on a regular basis.

These several types of service have left boards, administrators, and teachers with new questions that cannot be resolved without careful systematic specializing in applications of the new media.

Early consideration should be given to the general nature of the system, its purpose, function, and cost. The advantages and disadvantages of television need to be examined against or in conjunction with other types of modern communication media, and in connection with institutional policy involving radio, programmed instruction, films, and audio-visual aids generally. The type of ETV service needed must also be determined. Is it to be an instructional television fixed service, a closed-circuit television service either by leased or institutionally owned lines or an ETV broadcast station? In the case of the latter there is the further question. Is this broadcast station to be a satellite station (transmitter, tower, and antenna without an originating studio facility and using the signal from another station), a translator station (low-cost repeater), or a full-scale, program-producing, educational broadcast station? Federal grants under P.L. 87-447 are limited to the construction of broadcast stations and do not include the instructional television fixed service or closed circuit. (However, broadcast equipment, supported by a federal grant, may be used "incidentally" for closed circuit.)

Act Based on Local Control

The Educational Television Facilities Act as written is firmly based on the

principle of local control of the means for education. One may deduce from it the broad pattern of the national educational television broadcast structure which it was written to promote. This structure is based on a large number of independent locally controlled outlets providing televised educational opportunity to as many people as need and seek it from all sectors of our society. Stations are to be organized in a variety of ways consistent with the institutional variety within the nation's educational system, yet whatever their sponsorship they are to adapt to the broadest educational requirements of the local community.

Key elements of the Act give full scope to the adaptive and experimental virtues inherent in our federal system. Some of the notable provisions follow.

First, a wide range of agencies are included among eligible applicants: an office responsible for the supervision of public elementary or secondary education or public higher education within a state or subdivision, a state educational television agency, a tax-supported college or university, and a nonprofit organization formed primarily for educational television purposes and eligible for an educational television license from the FCC. Of particular importance is the eligibility of nonprofit foundations, corporations, or associations organized for educational television. Corporation members may include libraries, museums, educational and community associations, and schools, colleges, and universities, both public and private. At present, approximately one third of the 85 existing educational television stations are operated by such corporations or associations. While it is too early to be definite, it appears that there will be an increase in such cooperative arrangements between educational institutions, spurred in part by the criteria of the Act.

By adopting the matching grant principle of financing, the Act encourages the development of strong local leadership. To provide necessary state and local financial support requires the development of local organization and local direction.

No federal funds are provided for operations. The continued operation and programming of the stations are regarded as the total responsibility of local management. When the aid from the federal government for plant development is no longer available, school districts and state and local units of government must be ready to maintain and extend educational television resources.

An important force for localism is the provision which limits the amount eligible for interconnection of two or more stations to 15 percent of the federal grant. According to the Conference committee report this was "to assure that most of the available funds will be used for putting new educational broadcasting stations on the air." This provision is calculated to have the effect of encouraging greater development of local studio production facilities, thus permitting an increased amount of lo-

cally developed programs.

Finally, any federal involvement in or control of programming is prohibited under Section 397 of the Act. "No department, agency, officer or employee of the United States" may exercise "any direction, supervision or control over educational television broadcasting or over the curriculum, program of instruction, or personnel of any educational institution, school system, or educational broadcasting station or system."

It must be added, however, that freedom of operation does not include the right to financial or technical mismanagement. Federal administrators are required under the Act to be assured that the projects are technically and financially sound. The approval of any project will require assurance that the equipment included meets minimum performance for broadcasting. Sound budgeting practice and record keeping will be encouraged. The secretary must not only be assured that funds are available to construct and operate a television station but also to maintain it. It has been observed since the early 1930's when the matching-fund method was first used on any scale, that partnerships between the federal government and the states and localities involving joint funding on a matching basis have helped achieve new levels of effective administration.

Should a school system or institution of higher learning participate in the activation of an educational television broadcast station under the Educational Television Facilities Act?

As responsible officials consider the answer many will first ask, "Does such an action weaken or strengthen local control of education?"

Schools and ETV Broadcast Stations

The Educational Television Broadcast station can become both a defense of localism and a force to increase freedom of choice in America. For those involved with formal education — boards, administrators, teachers, and students — freedom is greatly increased because of the greater range of curriculum choices; furthermore, the opportunities for effective operation of both small and large units are substantially improved.

There are several results which may reasonably be expected of the ETV broadcast station. Its ability to provide instructional programs over a wide geographical area at a cost per capita which is small and which becomes smaller as more districts participate, makes it particularly suited to overcoming difficulties faced by the small educational unit. Consider the ETV broadcast station in relation to the findings of The Rocky Mountain Area Project for necessarily existant small-schools cited by William C. Bruce in the *AMERICAN SCHOOL BOARD JOURNAL* for July, 1962. Important problems for the small school, noted in a staff report, included: offering a broad enough curriculum, hiring enough well-prepared teachers, and overcoming logistic difficulties. Suggested solutions include many for which broadcast television is especially suited.

such as: sharing with several schools the services which cost per student would not permit if only a few schools were involved, teaching two or more subjects simultaneously, and providing materials which might otherwise be unavailable by means of carefully prepared technical resources.

Broadcast television provides a singularly great opportunity to the student in a small school district who can be served with educational materials necessary to an expanded and intensified program provided the district shares costs on a pro rata basis with a sufficiently large common market. (When the cooperative arrangement is dependent on the participation of a large urban district, a decision by the large district to introduce closed-circuit or instructional television fixed service may have the effect of depriving adjacent small districts of a principal means for rounding, enriching, and intensifying their curriculum by removing the major school audience which could make the larger service economically sound.) In subject areas where there is no foreseeable way in which sufficient teachers can be produced to meet the needs for instruction through traditional means, television provides a means for overcoming the limitation and opening up choices for the student. Even restrictions imposed by the school day, particularly for pupils transported by bus, need not be final in a school system which can broadcast instruction to television sets in the home.

The Question of Autonomy

In any cooperative arrangement between the independent units of our educational system, the question of autonomy is important. In the case of educational television two points should be made. First, it is the local school board and school administration, with the power of the purse strings, of approval and disapproval, and of cooperation or noncooperation, which control decisions as to the use of the medium. The ability of the ETV station to grow and flourish is dependent totally or in large part on the reactions of the school districts served. Experience has shown that school systems are not revolutionized with the introduction of televised instruction. They move very gradually into its use and must be convinced by concrete demonstrations of improved education. Second, the district with a television broadcast service has a greater range of curriculum opportunities available to it. Autonomy, measured by the number of available free choices, has not been restricted but rather has been greatly increased.

The educational television station not only widens the choices available to the student in school, but because the signal may be received in the home, it contributes to increased freedom of communication in our society. The Educational Television Facilities Act is a positive step to encourage the development and decentralized control of increased numbers of channels of communication.

STEPS IN PLANNING AN EDUCATIONAL TELEVISION STATION

1. Review the local educational television situation. Examine the functions being performed by the nearest existing or proposed educational television broadcast stations, especially in relation to possible duplication of effort by the contemplated new facility. Inquire of the FCC as to channel availability. Study the relevant state and regional engineering surveys and educational television broadcast plans.
2. Undertake a survey of the educational needs, cultural and instructional, of the area to be served. Determine whether or not an educational television broadcast station is the best available means for meeting those needs. Would closed-circuit television or an instructional television fixed service be more suitable? How may the station be used in conjunction with traditional classroom methods and the new educational media such as film, FM radio, or teaching machines? For what cultural and social needs, as well as vocational and professional needs, can the station provide service?
3. Discuss with the various educational agencies and authorities in the area the best organizational and operational pattern to meet effectively immediate and long-range educational needs. If a grant under P.L. 87-447 is contemplated, consider carefully the statutory objective of the Act, to provide facilities "which will serve the greatest number of persons and serve them in as many areas as possible, and which are adaptable to the broadest educational uses."

If after undertaking these steps an educational television station seems desirable then:

4. Arrange for necessary professional engineering and legal counsel.
5. Become informed as to the steps to be taken before the Federal Communications Commission.
6. Secure estimates from various equipment manufacturers for equipment which will best meet the educational purposes determined for the broadcast station.
7. Inform HEW as to plans and proposed actions so that the program staff may keep abreast of developments and possible demand for federal assistance.
8. Continue planning with educational authorities in the area. Develop specific program and budget requirements. Encourage involvement of teachers and administrators in planning ways to use the new service. Involve community organizations in planning and funding.

As for closed-circuit or fixed television systems, what are the principal advantages of these systems when contrasted to broadcast television? With either system it is possible to provide televised instruction to a number of grades in a school system at the same time. In contrast to broadcast television—which almost always is limited to a single channel and a single program except in those few areas where two channels are available to educators—closed-circuit or fixed television can provide multiple channels if desired. Second, these systems are essentially private in nature. This, it is argued, has several benefits. It is not necessary to be as careful in the production of programs, with the result that programming costs may be reduced. Programs are more private and are directed to a limited audience with the result that the material may be tailor-made and there is less likelihood of sail trimming in the face of possible public criticism.

Costs of ETV Systems

In many educational debates, cost has a way of determining the outcome. When comparing costs of ETV systems there are a number of points to remember. First, each type of operation provides a different kind of service. Cost comparison should not be interpreted as suggesting that equal service is available from the systems being compared. Second, there are great variations of cost within each system and quick comparisons should be viewed with caution. For example, the annual operating costs of single ETV broadcast stations range from \$52,000 to \$826,000,

and capital outlays range even more widely. It is possible to estimate the cost of an instructional television fixed service, with one channel and some 50 receiver units, at less than \$25,000; it is possible also to fix the final total at seven times that amount. Third, accurate and reliable cost figures for particular installations can only be determined when the particular engineering requirements are known which determine the equipment selected. Fourth, it is programming cost rather than capital outlay that is important in the long run. On the average, ETV broadcast station costs over two years equal the capital outlay for the ETV station, although at times this generalization seems made up almost totally of exceptions. A fact often overlooked in any discussion of multichannel operation is that each channel must be budgeted for programming. Experience in multiple channel operation is very limited. It is estimated by some that operation of a second channel, using programs which do not duplicate that of the first, would be as high as 80 percent of the operating and materials cost of the first channel and certainly no lower than 60 percent. This is a guess, but there is no uncertainty about the fact that multiple channels will require multiplication of program budgets. Finally, and perhaps most important when first giving consideration to educational television, estimated costs of construction and operation should not be considered as "additional burdens" to be piled on an already strained budget. As with a modernization program in industry, or the addition of equipment on a farm, the investment

should be considered in terms of long-term savings and an improved product.

Increased Demand for ETV

Examine the list of applications for grants under the Educational Television Facilities Act, and it can be observed that where television has been used there is a demand for further development. States with developed systems, are seeking to expand them. A proposal from Utah seeks to extend service to persons living in the sparsely populated pockets and crevices of a rugged terrain through a major system of 13 inexpensive translator stations which will repeat the signal of the programming station located at the state university. South Carolina is extending its state-wide closed-circuit service through the activation of two educational television broadcast stations. In major centers of population, such as Chicago, Minneapolis-St. Paul, and San Francisco, where ETV stations have been in operation for years, applications have been accepted or approved for the activation of second stations. These areas will join six others where two ETV stations are already in operation. During the past year state legislatures have responded to the existing evidence, among them Maine, Kentucky, Tennessee, North Carolina, Nebraska, Arkansas, by providing the means for initiating state-wide networks of television stations.

Whatever system of television is selected by a school administration, it can become a powerful force in meeting the demands now being made of the nation's educational system. "The quality and quantity of our education effort should be stepped up at all levels," President Lyndon Johnson has stated, "in an effort to help persons attain the background they need." The effective application of television to the school program can be an important step in meeting that challenge.

Sources of Further Information on Educational Television

Educational Television Facilities Act:

Secretary of Health, Education, and Welfare
Educational Television Program Register
Department of Health, Education, and Welfare
Washington, D. C.

Role of Federal Communications Commission:

Chief, Educational Broadcasting Branch
Federal Communications Commission
Washington, D. C.

Opportunities for grants and contracts for research and demonstrations in the use of new educational media as well as information on the results of completed research and demonstrations:

Director, Educational Media Branch
Office of Education
Department of Health, Education, and Welfare
Washington, D. C.

Surplus property for ETV stations:

Chief, Division of Surplus Property Utilization
Office of Field Administration
Department of Health, Education, and Welfare
Washington, D. C.

Available programs on video tape:

National Instructional Television Library
10 Columbus Circle
New York, N. Y. 10019
Great Plains Regional Instructional Television Library
The Assemmacher Building
The University of Nebraska
Lincoln, Neb. 68508
Eastern Educational Network
238 Main Street
Cambridge, Mass. 02142